

CLAIMS

I claim:

1. An apparatus comprising:

a riser tensioner having a movable support and a fixed support;

a sensor target interconnected to one of said movable support and said fixed support of said riser tensioner;

a sensor tube cooperative with said sensor target, said sensor tube being interconnected to the other of said movable support and said fixed support of said riser tensioner; and

a sensing means cooperative with said sensor tube, said sensor means for sensing a distance that said sensor target moves within said sensor tube.

2. The apparatus of Claim 1, further comprising:

a processing means connected to said sensor means for providing a humanly perceivable measurement of wear on a cable extending on said riser tensioner.

3. The apparatus of Claim 1, said riser tensioner comprising:

a first sheave housing supporting a plurality of rotatable sheaves thereon;

a second sheave housing supporting a plurality of rotatable sheaves thereon;

and

a cable threaded over said plurality of rotatable sheaves of said first sheave housing and over said plurality of rotatable sheaves of said second sheave housing.

4. The apparatus of Claim 3, said riser tensioner further comprising:

a compressing means interconnected between said first and second sheave housings, said compressing means for resiliently connecting said first sheave housing to said second sheave housing.

5. The apparatus of Claim 4, said riser tensioner further comprising:

an inner tube connected to said first sheave housing; and

an outer tube connected to said second sheave housing, said inner tube resiliently received within said outer tube, said compressing means being a source of hydraulic or pneumatic pressure supplied to an interior of said inner tube and said outer tube so as to provide a resistance to movement of said first sheave housing with respect to said second sheave housing.

6. The apparatus of Claim 1, said sensor target comprising:

an annular member interconnected to said riser tensioner so as to move relative to a movement of said movable support with respect to said fixed support;

a magnet received within said annular member; and

a metallic member positioned interior of said sensor tube, said magnet magnetically suspending said metallic member within said sensor tube.

7. The apparatus of Claim 6, said magnet being a circular magnet having an inner diameter, said circular magnet extending entirely around a circumference of said sensor tube.

8. The apparatus of Claim 7, further comprising:

a wear surface resiliently affixed to said inner diameter of said circular magnet so as to be interposed between said circular magnet and said sensor tube.

9. The apparatus of Claim 6, further comprising:

a support rod having one end affixed to said movable support and an opposite end affixed to said annular member, said support rod extending horizontally outwardly of said annular member.

10. The apparatus of Claims 6, said metallic member being sphere formed of a material magnetically attractive to said magnet.

11. The apparatus of Claim 5, further comprising:

a base affixed to a surface of said sensor tube and secured to a surface that is fixed relative to a movement of said movable support.

12. The apparatus of Claim 11, said surface being a plate affixed to said outer tube and extending therefrom, said base being connected to said plate, the apparatus further comprising:

a flex coupling interposed between said base and a top of said plate so as to provide a flexible connection between said sensor tube and said plate.

13. The apparatus of Claim 1, said sensing means connected to a bottom of said sensor tube and directed upwardly within said sensor tube.

14. The apparatus of Claim 13, said sensor target comprising:

a spherical member movable positioned within said sensor tube, said spherical member movable within said sensing tube relative to a relative movement of said fixed support with respect to said movable support, said sensor means being an ultrasonic sensor, said ultrasonic sensor being interactive with said spherical member.

15. A sensor apparatus for providing an indication of relative movement between sheave assemblies of a riser tensioner system, the sensor apparatus comprising:

a sensor target suitable for interconnection to one of the sheave assemblies;

a sensor tube cooperative with said sensor target, said sensor tube suitable for interconnection to the other of the sheave assemblies;

a metallic member positioned within said sensor tube and suspended by said sensor target, said metallic member being movable within said sensor tube in relation to relative movement between said sensor target and said sensor tube; and

a sensing means cooperative with said sensor tube, said sensing means for sensing a distance at said metallic member moves in said sensor tube.

16. The sensor apparatus of Claim 15, said sensor target comprising:

an annular member;

a magnet received within said annular member, said magnet positioned relative to said sensor tube so as to suspend said metallic member within said sensor tube.

17. The sensor apparatus of Claim 16, said magnet being a circular magnet having an inner diameter, said circular magnet extending outwardly around a circumference of said sensor tube, said circular magnet having a wear surface removably affixed to said inner diameter of said circular magnet so as to be interposed between said circular magnet and said sensor tube.

18. The sensor apparatus of Claim 16, said metallic member being sphere formed of a material magnetically attractive to said magnet.

19. The sensor apparatus Claim 15, said metallic member comprising:

a spherical member movably positioned within said sensor tube, said spherical member movable within said sensor tube relative to a relative movement between the sheave assemblies of the riser tensioner, said sensing means being an ultrasonic sensor, said ultrasonic sensor being connected to a bottom of said sensor tube and directed upwardly within said sensor tube so as to be interactive with said spherical member.

20. The sensor apparatus of Claim 15, further comprising:

a processing means connected to said sensing means for providing a humanly perceivable measurement of wear on a cable extending around the sheave assemblies of the riser tensioner.